

Name _____

Date _____ Block _____

MODELING WITH EXPONENTIAL FUNCTIONS

1. A population of 100 bacteria doubles every hour. Write an exponential function, $p(h)$, to model the population, p , after h hours.
2. Joe bought a house for \$95,000. Assuming the value of the house will appreciate 4% each year, how much will the apartment be worth in 3 years?
3. You have \$600 in a bank account and you spend 25% of the remaining money every month. Write the exponential function to model this situation.
4. A pet store has 12 gerbils, which triple in population every 4 months. Write the function $g(m)$ to represent g , the number of gerbils, after m months.
5. There are currently 900 bacteria in a Petri dish. If the population of the bacteria in the dish doubles every 3 hours, write an expression, $f(n)$, that represents the number of bacteria n hours from now?
6. A company commits to reducing its petroleum fuel use by 15% each year from the preceding year. If the company used 50,000 gallons of fuel in the year prior to starting the program, which formula, $f(n)$, represents the fuel used during year n of the program?
 - a. $f(n) = 50,000 - 0.85^n$
 - b. $f(n) = 50,000^{0.85^n}$
 - c. $f(n) = 50,000(0.85)^n$
 - d. $f(n) = (50,000 \cdot 0.85)^n$

7. A delivery van valued at \$45,000 today is depreciating in value exponentially at a rate of 14% each year. Which expression represents its expected value in 9 years?
- a. $f(n) = 45,000(1.14)^9$ b. $f(n) = 45,000(0.86)^9$
c. $f(n) = 45,000 + 45,000(0.14)^9$ d. $f(n) = 45,000 - 45,000(0.14)^9$
8. The value of a home in Pinellas County, Florida is increasing exponentially at a rate of 1.7% per year. If the current value of the home is \$110,000, what will the value be in 10 years, to the nearest dollar?
9. When rabbits were first brought to Australia last century, they had no natural enemies so their numbers increased rapidly. There were 20,000 rabbits during the first census. Two years later, the number increased to 1,200,000. What is the particular equation for this exponential function?
10. As Bob starts to get sick, the bacteria population in his body doubles every 2 days. He begins with 300 bacteria.
- a. Write an equation that models this situation.
- b. How many bacteria will there be after 6 days? Show work.
11. When the bacteria population reaches 10,000, Bob starts taking medicine. The medicine decreases the bacteria population by 20% each day
- a. Does this situation represent growth or decay? Explain.
- b. Write an equation that models this situation.
- c. How many bacteria will be in Bob's body after 3 days? Show work.